WE CLAIM:

1. A sensing apparatus, comprising:

a sensor array comprising at least a first sensor and a second sensor, the sensor array having associated therewith a spatial coordinate system, the first sensor having a first sensor location, the second sensor having a second sensor location, the first sensor location being proximate to a location of a first extremum of at least one basis function of a domain transform, the at least one basis function having at least one spatial coordinate defined according to the spatial coordinate system, the second sensor location being proximate to a location of a second extremum of the at least one basis function; and

at least one filter coupled to receive a signal from the first sensor, the at least one filter being further coupled to receive a signal from the second sensor, the at least one filter being configured to generate a first filter output signal, the first filter output signal comprising a weighted sum of at least the signal from the first sensor and the signal from the second sensor.

2. A sensing apparatus according to claim 1, wherein the domain transform comprises at least one of a Fourier transform and a cosine transform.

3. A sensing apparatus according to claim 2, wherein the first sensor location has a first distance from a reference location in a unit cell of the sensor array, the unit cell having a unit cell size, the second sensor location having a second distance from the reference location, the first distance being essentially equal to a product of the unit cell size and a first Farey fraction, the second distance being essentially equal to a product of the unit cell size and a second Farey fraction.

4. A sensing apparatus according to claim 1, wherein the first sensor location has a first distance from a reference location in a unit cell of the sensor array, the unit cell having a unit cell size, the second sensor location having a second distance from the reference location, the first distance being essentially equal to a product of the unit cell size and a first Farey fraction, the second distance

being essentially equal to a product of the unit cell size and a second Farey fraction.

5. A sensing apparatus according to claim 4, wherein the sensor array further comprises a third sensor and a fourth sensor, the third sensor having a third sensor location, the fourth sensor having a fourth sensor location, the third sensor location having a third distance from the reference location, the fourth sensor location having a fourth distance from the reference location, the third distance being essentially equal to a product of the unit cell size and a third Farey fraction, the fourth distance being essentially equal to a product of the unit cell size and a fourth Farey fraction, the at least one filter comprising:

a first filter coupled to receive the signal from the first sensor, the first filter being further coupled to receive the signal from the second sensor, the first filter being configured to generate the first filter output signal;

a second filter coupled to receive a signal from the third sensor, the second filter being further coupled to receive a signal from the fourth sensor, the second filter being configured to generate a second filter output signal, the second filter output signal comprising a weighted sum of at least the signal from the third sensor and the signal from the fourth sensor; and

a third filter coupled to receive the first and second filter output signals, the third filter being configured to generate a third filter output signal, the third filter output signal comprising a sum of:

a product of the first filter output signal and a first value of a Mobius function, and

a product of the second filter output signal and a second value of the Mobius function.

6. A sensing apparatus according to claim 1, wherein the sensor array further comprises a third sensor and a fourth sensor, the third sensor having a third sensor location, the fourth sensor having a fourth sensor location, the third sensor location being proximate to a location of a third extremum of the at least one basis function, the fourth sensor location being proximate to a

location of a fourth extremum of the at least one basis function, the at least one filter comprising:

a first filter coupled to receive the signal from the first sensor, the first filter being further coupled to receive the signal from the second sensor, the first filter being configured to generate the first filter output signal;

a second filter coupled to receive a signal from the third sensor, the second filter being further coupled to receive a signal from the fourth sensor, the second filter being configured to generate a second filter output signal, the second filter output signal comprising a weighted sum of at least the signal from the third sensor and the signal from the fourth sensor; and

a third filter coupled to receive the first and second filter output signals, the third filter being configured to generate a third filter output signal, the third filter output signal comprising a sum of:

a product of the first filter output signal and a first value of a Mobius function, and

a product of the second filter output signal and a second value of the Mobius function.

7. A sensing apparatus according to claim 6, wherein the first, second, third, and fourth sensors are included in a plurality of sensors, the plurality of sensors further including fifth, sixth, seventh, and eighth sensors, the plurality of sensors being configured to generate a plurality of sensor signals, the plurality of sensor signals including the respective signals from the first, second, third, and fourth sensors, the plurality of sensor signals further including respective signals from the fifth, sixth, seventh, and eighth sensors, the at least one filter further comprising:

a fourth filter coupled to receive the respective signals from the fifth and sixth sensors, the fourth filter being configured to generate a fourth filter output signal comprising a weighted sum of at least the respective signals from the fifth and sixth sensors;

a fifth filter coupled to receive the respective signals from the seventh and eighth sensors, the fifth filter being configured to generate a fifth

filter output signal comprising a weighted sum of at least the respective signals from the seventh and eighth sensors; and

a sixth filter coupled to receive the fourth and fifth filter output signals, the sixth filter being configured to generate a sixth filter output signal comprising a sum of:

a product of the fourth filter output signal and a third value of the Mobius function, and

a product of the fifth filter output signal and a fourth value of the Mobius function, the sensing apparatus further comprising a first correction circuit, the first correction circuit being configured to generate a first correction signal, the first correction signal comprising a product of:

(a) a sum of values of the Mobius function, and

(b) at least one of: (i) a mean value of the plurality of signals, and (ii) the sixth filter output signal, the first correction circuit being further configured to generate a first corrected filter output signal, the first corrected filter output signal comprising a sum or difference of the third filter output signal and the first correction signal.

8. A sensing apparatus according to claim 7, wherein the plurality of sensors further includes ninth, tenth, eleventh, and twelfth sensors, the plurality of sensor signals further including respective signals from the ninth, eleventh, and twelfth sensors, the at least one filter further comprising:

a seventh filter coupled to receive the respective signals from the ninth and tenth sensors, the seventh filter being configured to generate a seventh filter output signal comprising a weighted sum of at least the respective signals from the ninth and tenth sensors;

an eighth filter coupled to receive the respective signals from the eleventh and twelfth sensors, the eighth filter being configured to generate an eighth filter output signal comprising a weighted sum of at least the respective signals from the eleventh and twelfth sensors; and

a ninth filter coupled to receive the seventh and eighth filter output signals, the ninth filter being configured to generate a ninth filter output

signal comprising a sum of:

a product of the seventh filter output signal and a fifth value of the Mobius function, and

a product of the eighth filter output signal and a sixth value of the Mobius function, the sensing apparatus further comprising a second correction circuit, the second correction circuit being configured to generate a second correction signal, the second correction signal comprising the eighth filter output signal, the second correction circuit being further configured to generate a second corrected filter output signal, the second corrected filter output signal comprising a sum or difference of the first corrected filter output signal and the second correction signal.

9. A sensing apparatus according to claim 6, wherein the first, second, third, and fourth sensors are included in a plurality of sensors, the plurality of sensors further including fifth, sixth, seventh, and eighth sensors, the plurality of sensors being configured to generate a plurality of sensor signals, the plurality of sensor signals including the respective signals from the first, second, third, and fourth sensors, the plurality of sensor signals further including respective signals from the fifth, sixth, seventh, and eighth sensors, the at least one filter further comprising:

a fourth filter coupled to receive the respective signals from the fifth and sixth sensors, the fourth filter being configured to generate a fourth filter output signal comprising a weighted sum of at least the respective signals from the fifth and sixth sensors;

a fifth filter coupled to receive the respective signals from the seventh and eighth sensors, the fifth filter being configured to generate a fifth filter output signal comprising a weighted sum of at least the respective signals from the seventh and eighth sensors; and

a sixth filter coupled to receive the fourth and fifth filter output signals, the sixth filter being configured to generate a sixth filter output signal comprising a sum of:

a product of the fourth filter output signal and a third

value of the Mobius function, and

a product of the fifth filter output signal and a fourth value of the Mobius function, the sensing apparatus further comprising a correction circuit, the correction circuit being configured to generate a correction signal, the correction signal comprising the sixth filter output signal, the correction circuit being further configured to generate a corrected filter output signal, the corrected filter output signal comprising a sum or difference of the third filter output signal and the correction signal.

10. A sensing apparatus according to claim 1, wherein the at least one filter comprises:

a first amplifier coupled to receive the signal from the first sensor for generating a first amplifier output signal;

a second amplifier coupled to receive the signal from the second sensor for generating a second amplifier output signal; and

an integrator coupled to receive and integrate the first and second amplifier output signals for generating an integrated signal, the first filter output signal comprising the integrated signal.

11. A sensing apparatus according to claim 1, wherein the at least one filter comprises a digital filter.

12. A sensing apparatus, comprising:

a sensor array comprising a plurality of sensors, the plurality of sensors including at least a first sensor and a second sensor, the sensor array having associated therewith a spatial coordinate system, the first sensor having a first sensor location, the second sensor having a second sensor location, the sensor array being coupled to receive an incoming signal, the incoming signal having a first incoming signal value at the first sensor location, the incoming signal having a second incoming signal value at the second sensor location; and

an interpolation circuit coupled to receive a signal from the first sensor, the interpolation circuit being further coupled to receive a signal from the second sensor, the signal from the first sensor representing the first

incoming signal value, the signal from the second sensor representing the second incoming signal value, the interpolation circuit being configured to interpolate the signal from the first sensor and the signal from the second sensor for generating a first interpolated signal, the first interpolated signal representing an approximate value of the incoming signal at a location proximate to a first extremum of at least one basis function of a domain transform, the at least one basis function having at least one spatial coordinate defined according to the spatial coordinate system.

13. A sensing apparatus according to claim 12, wherein the domain transform comprises at least one of a Fourier transform and a cosine transform.

14. A sensing apparatus according to claim 12, wherein the interpolation circuit is further configured to interpolate a first set of at least two signals from the plurality of sensors for generating a second interpolated signal, the second interpolated signal representing an approximate value of the incoming signal at a location proximate to a second extremum of the at least one basis function, the sensing apparatus further comprising at least one filter coupled to receive the first and second interpolated signals, the at least one filter being configured to generate a first filter output signal, the first filter output signal comprising a weighted sum of at least the first and second interpolated signals.

15. A sensing apparatus according to claim 14, wherein the interpolation circuit is further configured to interpolate a second set of at least two signals from the plurality of sensors for generating a third interpolated signal, the third interpolated signal representing an approximate value of the incoming signal at a location proximate to a third extremum of the at least one basis function, the interpolation circuit being further configured to interpolate a third set of at least two signals from the plurality of sensors for generating a fourth interpolated signal, the fourth interpolated signal representing an approximate value of the incoming signal at a location proximate to a fourth extremum of the at least one basis function, the at least one filter comprising:

a first filter coupled to receive the first interpolated signal from the interpolation circuit, the first filter being further coupled to receive the

second interpolated signal from the interpolation circuit, the first filter being configured to generate the first filter output signal;

a second filter coupled to receive the third interpolated signal from the interpolation circuit, the second filter being further coupled to receive the fourth interpolated signal from the interpolation circuit, the second filter being configured to generate a second filter output signal, the second filter output signal comprising a weighted sum of at least the third and fourth interpolated signals; and

a third filter coupled to receive the first and second filter output signals, the third filter being configured to generate a third filter output signal, the third filter output signal comprising a sum of:

a product of the first filter output signal and a first value of a Mobius function, and

a product of the second filter output signal and a second value of the Mobius function.

16. A sensing apparatus according to claim 14, wherein the at least one filter comprises:

a first amplifier coupled to receive the first integrated signal from the interpolation circuit for generating a first amplifier output signal;

a second amplifier coupled to receive the second interpolated signal from the interpolation circuit for generating a second amplifier output signal; and

an integrator coupled to receive and integrate the first and second amplifier output signals for generating an integrated signal, the first filter output signal comprising the integrated signal.

17. A sensing apparatus according to claim 14, wherein the at least one filter comprises a digital filter.

18. A sensing method, comprising:

receiving an incoming signal by a sensor array comprising at least a first sensor and a second sensor, the sensor array having associated therewith a spatial coordinate system, the first sensor having a first sensor

location, the second sensor having a second sensor location, the first sensor location being proximate to a location of a first extremum of at least one basis function of a domain transform, the at least one basis function having at least one spatial coordinate defined according to the spatial coordinate system, the second sensor location being proximate to a location of a second extremum of the at least one basis function;

detecting the incoming signal by the first sensor for generating a first sensor signal;

detecting the incoming signal by the second sensor for generating a second sensor signal;

receiving the first sensor signal by the at least one filter;

receiving the second sensor signal by the at least one filter; and

generating a first filtered signal by the at least one filter, the first filtered signal comprising a weighted sum of at least the first sensor signal and the second sensor signal.

19. A method according to claim 18, wherein the sensor array further comprises a third sensor and a fourth sensor, the third sensor having a third sensor location, the fourth sensor having a fourth sensor location, the third sensor location being proximate to a location of a third extremum of the at least one basis function, the fourth sensor location being proximate to a location of a fourth extremum of the at least one basis function, the method further comprising:

detecting the incoming signal by the third sensor for generating a third sensor signal;

detecting the incoming signal by the fourth sensor for generating a fourth sensor signal;

receiving the third sensor signal by the at least one filter;

receiving the fourth sensor signal by the at least one filter;

generating a second filtered signal by the at least one filter, the second filtered signal comprising a weighted sum of at least the third sensor signal and the fourth sensor signal; and

generating a third filtered signal by the at least one filter, the third filtered signal comprising a sum of:

a product of the first filtered signal and a first value of a Mobius function, and

a product of the second filtered signal and a second value of the Mobius function.

20. A method according to claim 19, wherein the first, second, third, and fourth sensors are included in a plurality of sensors, the plurality of sensors further including fifth, sixth, seventh, and eighth sensors, the first, second, third, and fourth sensor signals being included in a plurality of sensor signals, the method further comprising:

detecting the incoming signal by the fifth sensor for generating a fifth sensor signal;

detecting the incoming signal by the sixth sensor for generating a sixth sensor signal;

detecting the incoming signal by the seventh sensor for generating a seventh sensor signal;

detecting the incoming signal by the eighth sensor for generating an eighth sensor signal, the plurality of signals further including the fifth, sixth, seventh, and eighth sensor signals;

receiving the fifth, sixth, seventh, and eighth sensor signals by the at least one filter;

generating a fourth filtered signal by the at least one filter, the fourth filtered signal comprising a weighted sum of at least the fifth and sixth sensor signals;

generating a fifth filtered signal by the at least one filter, the fifth filtered signal comprising a weighted sum of at least the seventh and eighth sensor signals;

generating a sixth filtered signal by the at least one filter, the sixth filtered signal comprising a sum of:

a product of the fourth filtered signal and a third value

of the Mobius function, and

a product of the fifth filtered signal and a fourth value of the Mobius function;

generating a first correction signal, the first correction signal comprising a product of:

(a) a sum of values of the Mobius function, and

(b) at least one of: (i) a mean value of the plurality of signals, and (ii) the sixth filtered signal; and

generating a first corrected filter output signal, the first corrected filter output signal comprising a sum or difference of the third filtered signal and the first correction signal.

21. A method according to claim 20, wherein the plurality of sensors further includes ninth, tenth, eleventh, and twelfth sensors, the method further comprising:

detecting the incoming signal by the ninth sensor for generating a ninth sensor signal;

detecting the incoming signal by the tenth sensor for generating a tenth sensor signal;

detecting the incoming signal by the eleventh sensor for generating an eleventh sensor signal;

detecting the incoming signal by the twelfth sensor for generating a twelfth sensor signal, the plurality of signals further including the ninth, tenth, eleventh, and twelfth sensor signals;

receiving the ninth, tenth, eleventh, and twelfth sensor signals by the at least one filter;

generating a seventh filtered signal by the at least one filter, the seventh filtered signal comprising a weighted sum of at least the ninth and tenth sensor signals;

generating an eighth filtered signal by the at least one filter, the eighth filtered signal comprising a weighted sum of at least the eleventh and twelfth sensor signals;

generating a ninth filtered signal by the at least one filter, the ninth filtered signal comprising a sum of:

a product of the seventh filtered signal and a fifth value of the Mobius function, and

a product of the eighth filtered signal and a sixth value of the Mobius function;

generating a second correction signal, the second correction signal comprising the eighth filtered signal; and

generating a second corrected filter output signal, the second corrected filter output signal comprising a sum or difference of the first corrected filter output signal and the second correction signal.

22. A method according to claim 19, wherein the first, second, third, and fourth sensors are included in a plurality of sensors, the plurality of sensors further including fifth, sixth, seventh, and eighth sensors, the first, second, third, and fourth sensor signals being included in a plurality of sensor signals, the method further comprising:

detecting the incoming signal by the fifth sensor for generating a fifth sensor signal;

detecting the incoming signal by the sixth sensor for generating a sixth sensor signal;

detecting the incoming signal by the seventh sensor for generating a seventh sensor signal;

detecting the incoming signal by the eighth sensor for generating an eighth sensor signal, the plurality of signals further including the fifth, sixth, seventh, and eighth sensor signals;

receiving the fifth, sixth, seventh, and eighth sensor signals by the at least one filter;

generating a fourth filtered signal by the at least one filter, the fourth filtered signal comprising a weighted sum of at least the fifth and sixth sensor signals;

generating a fifth filtered signal by the at least one filter, the

fifth filtered signal comprising a weighted sum of at least the seventh and eighth sensor signals;

generating a sixth filtered signal by the at least one filter, the sixth filtered signal comprising a sum of:

a product of the fourth filtered signal and a third value of the Mobius function, and

a product of the fifth filtered signal and a fourth value of the Mobius function;

generating a correction signal, the correction signal comprising the sixth filter output signal; and

generating a corrected filter output signal, the corrected filter output signal comprising a sum or difference of the third filtered signal and the correction signal.

23. A method according to claim 18, wherein the step of generating the first filtered signal comprises:

amplifying the first sensor signal for generating a first amplified signal;

amplifying the second sensor signal for generating a second amplified signal; and

integrating the first and second amplified signals for generating an integrated signal, the first filtered signal comprising the integrated signal.

24. A method according to claim 18, wherein the step of generating the first filtered signal comprises digitally computing the weighted sum of at least the first sensor signal and the second sensor signal.

25. A sensing method, comprising:

receiving an incoming signal by a sensor array comprising a plurality of sensors, the plurality of sensors including at least a first sensor and a second sensor, the sensor array having associated therewith a spatial coordinate system, the first sensor having a first sensor location, the second sensor having a second sensor location, the incoming signal having a first

incoming signal value at the first sensor location, the incoming signal having a second incoming signal value at the second sensor location;

detecting the incoming signal by the first sensor for generating a first sensor signal, the first sensor signal representing the first incoming signal value;

detecting the incoming signal by the second sensor for generating a second sensor signal, the second sensor signal representing the second incoming signal value;

receiving the first sensor signal by an interpolation circuit;

receiving the second sensor signal by the interpolation circuit; and

interpolating the first and second sensor signals by the interpolation circuit for generating a first interpolated signal, the first interpolated signal representing an approximate value of the incoming signal at a location proximate to a first extremum of at least one basis function of a domain transform, the at least one basis function having at least one spatial coordinate defined according to the spatial coordinate system.

26. A method according to claim 25, wherein the domain transform comprises at least one of a Fourier transform and a cosine transform.

27. A method according to claim 25, further comprising:

interpolating, by the interpolation circuit, a first set of at least two signals from the plurality of sensors for generating a second interpolated signal, the second interpolated signal representing an approximate value of the incoming signal at a location proximate to a second extremum of the at least one basis function;

receiving the first and second interpolated signals by at least one filter;

generating a first filtered signal by the at least one filter, the first filtered signal comprising a weighted sum of at least the first and second interpolated signals.

28. A method according to claim 27, further comprising:

interpolating, by the interpolation circuit, a second set of at least two signals from the plurality of sensors for generating a third interpolated signal, the third interpolated signal representing an approximate value of the incoming signal at a location proximate to a third extremum of the at least one basis function;

interpolating, by the interpolation circuit, a third set of at least two signals from the plurality of sensors for generating a fourth interpolated signal, the fourth interpolated signal representing an approximate value of the incoming signal at a location proximate to a fourth extremum of the at least one basis function;

receiving the third and fourth interpolated signals by the at least one filter;

generating a second filtered signal by the at least one filter, the second filtered signal comprising a weighted sum of at least the third and fourth interpolated signals; and

generating a third filtered signal by the at least one filter, the third filtered signal comprising a sum of:

a product of the first filtered signal and a first value of a Mobius function, and

a product of the second filtered signal and a second value of the Mobius function.

29. A method according to claim 27, wherein the step of generating the first filtered signal comprises:

amplifying the first interpolated signal for generating a first amplified signal;

amplifying the second interpolated signal for generating a second amplified signal; and

integrating the first and second amplified signals for generating an integrated signal, the first filtered signal comprising the integrated signal.

30. A method according to claim 27, wherein the step of generating the first filtered signal comprises digitally computing the weighted sum of at least the first and second interpolated signals.